නව නිර්දේශය/புதிய பாடத்திட்டம்/New Syllabus

NEW

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
இலங்கைப் பரீட்சைத் திணைக்களம்
Department of Examinations, Sri Lanka

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය, 2020
கல்விப் பொதுத் தராதரப் பத்திர (உயர் தர)ப் பரீட்சை, 2020
General Certificate of Education (Adv. Level) Examination, 2020

ජීව විද්‍යාව I உயிரியல் I **Biology I**	**09 E I**	පැය දෙකයි இரண்டு மணித்தியாலம் ***Two hours***

Instructions:

* *Answer **all** questions.*
* *Write your **Index Number** in the space provided in the answer sheet.*
* *Instructions are given on the back of the answer sheet. Follow them carefully.*
* *In each of the questions from **1** to **50**, pick one of the alternatives from (1), (2), (3), (4), (5) which is **correct** or **most appropriate** and **mark your response on the answer sheet with a cross** (×) on the number of the correct option in accordance with the instructions given on the back of the answer sheet.*

1. The first organisms formed on earth are considered to be
(1) heterotrophic, anaerobic eukaryotes.
(2) heterotrophic, aerobic prokaryotes.
(3) autotrophic, anaerobic eukaryotes.
(4) heterotrophic, anaerobic prokaryotes.
(5) autotrophic, aerobic prokaryotes.

2. Proteins
(1) form the secondary structure due to disulphide bonds.
(2) are made up of 26 different amino acids.
(3) are composed of C, H, O, N, S and P.
(4) would not be denatured by detergents.
(5) contribute to transport of materials.

3. Steps involved in observing an onion peel mounted on a glass slide and placed on the stage of a compound light microscope are as follows.

A - Adjusting the mirror
B - Use of fine focussing knob
C - Use of coarse focussing knob

The correct sequence of above steps are
(1) A, B and C. (2) A, C and B.
(3) B, A and C. (4) C, A and B.
(5) C, B and A.

4. Some features of cells are as follows.

A - Presence of plasma membrane
B - Presence of 70S ribosomes
C - Occurrence of mitosis
D - Presence of subcellular components suspended in cytosol

Which of the above features are common to prokaryotic and eukaryotic cells?
(1) A and B only. (2) B and C only.
(3) B and D only. (4) A, B and C only.
(5) A, B and D only.

[See page two

5. Which of the following statements regarding eukaryotic cell cycle is correct?
(1) Crossing over takes place in metaphase of meiosis I.
(2) Formation of chromatin occurs in G_1 phase.
(3) DNA replication occurs in G_2 phase.
(4) Nuclear envelope reforms during cytokinesis.
(5) Formation of mitotic spindle begins in prophase.

6. ATP
(1) is a nucleoside containing pentose sugar, adenine and phosphate groups.
(2) can be produced by oxidative phosphorylation using solar energy.
(3) hydrolyses to ADP releasing 30.5 kJ/mol of energy.
(4) is formed in pyruvate oxidation through substrate level phosphorylation.
(5) contains deoxyribose.

7. Which of the following is a characteristic of enzymes?
(1) They do not alter the nature of end products.
(2) They increase the activation energy of a reaction.
(3) They are not substrate specific.
(4) A small amount of enzyme is used up during the reaction.
(5) Any part of the enzyme molecule can catalyze a reaction.

8. Some statements regarding biochemical evolution are given below.
P - Small organic molecules such as amino acids and nitrogenous bases were first formed in early oceans.
Q - Small organic molecules polymerized to form organic macromolecules.
R - Protocells contained nucleic acids enclosed in a membrane.
Which of the above statements is/are correct?
(1) P only. (2) Q only. (3) P and Q only.
(4) Q and R only. (5) P, Q and R.

9. Some features of organisms are given below.

Cellular Organization	Peptidoglycan	RNA Polymerase	Response to Streptomycin
A – Prokaryotic B – Eukaryotic	P – Present Q – Absent	R – One kind S – Several kinds	X – Growth inhibited. Y – Growth not inhibited.

Select the response that indicates the correct combination of above features for each of the organisms given below.
(1) *Nostoc* – A, P, S, X
(2) *Thermococcus* – A, P, R, Y
(3) *Euglena* – B, P, S, X
(4) *Mucor* – B, Q, S, Y
(5) *Planaria* – B, Q, R, Y

10. Some structures seen among animals are as follows.
Protonephridia, mantle and nematocysts
Organisms showing each of the above structures in correct sequence are
(1) *Obelia*, hook worm and *Fasciola*.
(2) *Planaria*, slug and jellyfish.
(3) *Taenia*, pin worm and *Obelia*.
(4) *Fasciola*, earthworm and *Hydra*.
(5) Sea cucumber, snail and *Obelia*.

11. Spike mosses can be considered to be more similar to seed plants than club mosses do due to the presence of
(1) stems. (2) leaves. (3) heterospory.
(4) strobili. (5) dominant sporophyte.

[See page three

12. Several features seen among some chordates are as follows.

A - Keratinized structures
B - Internal fertilization
C - Parthenogenesis
D - Marine life

Which of the above features can be seen in the organisms of classes Reptilia, Aves and Mammalia?
(1) A and B only. (2) A and C only.
(3) B and D only. (4) A, B and C only.
(5) A, B and D only.

13. Collenchyma cells differ from parenchyma cells because collenchyma cells
(1) are non-living when mature.
(2) have a large central vacuole.
(3) have unevenly thickened cell walls.
(4) are thickened with lignin.
(5) are present in the vascular tissues of plants.

14. Shoot apical meristem
(1) increases height and diameter of stem.
(2) produces cells inwards and outwards.
(3) is composed of parenchyma cells.
(4) is composed of undiffentiated cells.
(5) contributes to primary and secondary growth of stem.

15. Dissolving of solutes in water
(1) increases water potential and solute potential.
(2) decreases water potential and solute potential.
(3) decreases water potential and increases solute potential.
(4) increases water potential and decreases solute potential.
(5) affects water potential and solute potential independent of each other.

16. Osmosis
(1) occurs due to diffusion of water molecules through a permeable membrane.
(2) occurs from a low water potential to a high water potential.
(3) is an active process.
(4) is the mechanism by which water enters root hairs from soil.
(5) reduces pressure in the sieve tube at the source.

17. Chlorosis in older leaves may be caused due to deficiency of which of the following elements?
(1) Mg and S (2) N and P (3) Cl and Fe (4) Mn and Zn (5) Mo and Ni

18. Seed of a fruit is developed from
(1) egg cell. (2) central cell. (3) embryo sac. (4) ovule. (5) ovary.

19. Some plant hormones are given below

A - Abscisic acid
B - Cytokinins
C - Ethylene
D - Gibberellins

Of the above hormones, leaf senescence is promoted by
(1) A and B only. (2) A and C only. (3) B and C only.
(4) C and D only. (5) A, B and C only.

20. Examples for plants showing homospory are
(1) *Pogonatum* and *Nephrolepis*. (2) *Lycopodium* and *Selaginella*.
(3) *Selaginella* and *Cycas*. (4) *Lycopodium* and *Gnetum*.
(5) *Nephrolepis* and *Pinus*.

[See page four

21. Mineral elements mainly required for maintaining acid base balance, nerve functioning and formation of bones in man in correct sequence are
(1) Mg, Fe and P. (2) P, K and Cl. (3) K, Na and I.
(4) Na, K and Cl. (5) Cl, Ca and P.

22. This question is based on the following.
A - Movement of lymph; contraction of cardiac muscle
B - Exchange of gases in capillaries; active transport
C - Clotting of blood; formation of thrombin
D - Transport of CO_2 in blood; participation of red blood cells.
In which of the above pairs, does the second contribute to the first?
(1) A and B (2) A and C (3) B and C (4) B and D (5) C and D

23. Four respiratory volumes of a resting person are as follows.
Inspiratory reserve volume = 2500 ml Tidal volume = 450 ml
Expiratory reserve volume = 1450 ml Residual volume = 1100 ml
Inspiratory capacity, functional residual capacity and vital capacity of this person in correct sequence are
(1) 2950 ml, 2550 ml and 4400 ml.
(2) 1900 ml, 1550 ml and 5050 ml.
(3) 2950 ml, 1900 ml and 4400 ml.
(4) 2550 ml, 3950 ml and 5050 ml.
(5) 2950 ml, 2550 ml and 5500 ml.

24. Which of the following excretory structures of animals opens into digestive tract?
(1) Green glands (2) Salt glands (3) Flame cells
(4) Malpighian tubles (5) Nephridia

25. Select the response that correctly indicates the part of the human brain and its function.
(1) Thalamus – regulation of appetite
(2) Hypothalamus – maintenance of posture
(3) Mid brain – coordination of visual reflexes
(4) Pons Varolii – regulation of sleep and awake cycles
(5) Cerebellum – initiation of fight or flight response

26. In the retina of the human eye, the cell layers are arranged from the choroid to vitreous humour respectively as
(1) epithelial layer, bipolar cells, ganglion cells and photoreceptors.
(2) photoreceptors, epithelial layer, ganglion cells and bipolar cells.
(3) epithelial layer, bipolar cells, photoreceptors and ganglion cells.
(4) ganglion cells, bipolar cells, photoreceptors and epithelial layer.
(5) epithelial layer, photoreceptors, bipolar cells and ganglion cells.

27. Stimulation of the sympathetic division of the autonomic nervous system in man
(1) decreases the rate of heart beat. (2) promotes digestion.
(3) constricts pupil of the eye. (4) stimulates urination.
(5) promotes ejaculation of semen.

28. The hormone that has a tropic effect and a non-tropic effect is
(1) TSH. (2) ACTH. (3) prolactin. (4) GH. (5) FSH.

29. Which of the following statements regarding asexual reproduction of animals is correct?
(1) It relies entirely on meiotic division.
(2) It may produce offspring with varied genotypes.
(3) It enhances the evolution of species in changing environments.
(4) It allows rapid multiplication of individuals from a single parent.
(5) New organisms can be developed from a sperm without fertilization.

[See page five

30. In the human skull,
(1) vomer contributes to form the cranium.
(2) ethmoid and sphenoid bones are facial bones.
(3) zygomatic and parietal bones contribute to form the zygomatic arch.
(4) mastoid process of mandible articulates with temporal bone.
(5) maxillary and frontal bones contain sinuses.

31. Hybrid vigour is
(1) increased by breeding among genetically similar individuals.
(2) higher in parents than in their F_1 generation.
(3) achieved by increasing heterozygocity.
(4) maintained by breeding among hybrids.
(5) a result of interspecific hybridization.

32. A function of topoisomerase is
(1) sealing the gaps of DNA strands.
(2) unwinding the double helix of DNA.
(3) stabilizing separated DNA strands.
(4) relaxing the strain of overtwisted DNA strands.
(5) breaking the hydrogen bonds between DNA strands.

33. Translation of eukaryotes differs from that of prokaryotes because it
(1) does not start before transcription is terminated.
(2) occurs in the nucleus.
(3) uses UAG, UAA or UGA as stop signals.
(4) does not form polysomes.
(5) does not start at AUG codon.

34. Which of the following responses indicates the biomes in increasing order of average annual rainfall/precipitation?
(1) Arctic tundra, temperate grasslands, temperate broad leaf forests
(2) Temperate grasslands, savannas, tropical rain forests
(3) Deserts, Alpine tundra, northern coniferous forests
(4) Arctic tundra, chaparrals, savannas
(5) Tropical dry forests, chaparrals, Alpine tundra

35. Select the response with three threatened organisms.
(1) Bengal tiger, dodo, Sri Lankan elephant
(2) Black ruby barb, giant tortoise, woolly mammoth
(3) Tilapia, water hyacinth, blue magpie
(4) Giant African land snail, giant panda, Indian fly catcher
(5) Maha madu, Wesak orchid, dusky-striped jungle squirrel

36. Which of the following international agreements may contribute to reduce global warming?

A - Kyoto protocol
B - Basel convention
C - Montreal protocol
D - Cartagena protocol

(1) A only. (2) A and B only. (3) A and C only.
(4) A, B and C only. (5) A, B and D only.

[See page six

37. Which of the following statements regarding microorganisms is correct?
(1) Almost all mycoplasmas are parasites of animals and plants.
(2) Fungi are chemoheterotrophs which show saprophytic or parasitic modes of nutrition.
(3) Purple non-sulphur bacteria utilize light as the source of energy and CO_2 as the source of carbon.
(4) Streptococcus bacteria divide in multiple planes.
(5) In cyanobacteria, nitrogen fixation is catalyzed by nitrogenase enzyme present in akinetes.

38. Some bacterial pathogens
(1) produce phospholipase which contributes to invasiveness.
(2) produce endotoxins which are thermolabile lipopolysaccharides.
(3) use the capsule and pili to enter host tissue.
(4) obtain nutrients from host cells without altering the metabolism of the host.
(5) produce lecithinase that breaks down the cementing substance between cells.

39. Which of the following statements regarding the roles of microorganisms is correct?
(1) When organic matter is mineralized by bacteria and fungi, oxygen, water and CO_2 are released.
(2) Methanotrophic microorganisms produce methane from ocean sediments.
(3) *Pseudomonas* sp. causes denitrification when oxygen is limited in soil.
(4) Rhizobia are free living nitrogen fixing bacteria in soil.
(5) All rhizosphere fungi are beneficial to plants.

40. Select the response which correctly indicates the disease and its causative microorganism.
(1) Botulism – *Staphylococcus* sp.
(2) Tetanus – *Clostridium* sp.
(3) Cholera – *Shigella* sp.
(4) Dysentry – *Salmonella* sp.
(5) Typhoid – *Vibrio* sp.

- **For each of the questions 41 to 50, one or more of the responses is/are correct. Decide which response/responses is/are correct and then select the correct number.**

If only (A), (B) and (D) are correct .... (1)
If only (A), (C) and (D) are correct .... (2)
If only (A) and (B) are correct .... (3)
If only (C) and (D) are correct .... (4)
If any other response or combination of responses is correct .... (5)

Directions summarised				
(1)	(2)	(3)	(4)	(5)
(A), (B), (D) correct.	(A), (C), (D) correct.	(A), (B) correct.	(C), (D) correct.	Any other response or combination of responses correct.

41. Select the features that can be seen in the tissues of the respiratory system of man.
(A) Single layer of plate like cells
(B) Single layer of cells of different heights
(C) Single layer of dice shaped cells
(D) Matrix with chondroitin sulphate
(E) Single layer of brick shaped cells

42. Three substances that the ingested food get encountered within the buccal cavity, stomach and small intestine of man in correct sequence are
(A) lysozymes, pepsin and aminopeptidase.
(B) immunoglobulins, HCl and chymotrypsin.
(C) salivary amylase, dipeptidase and lipase.
(D) mucus, pepsin and bile.
(E) lysozymes, carboxypeptidase and amylase.

[See page seven

43. Some features of circulatory systems and examples for animals showing each of those features are given below. Select the correct "feature-example" combination/combinations.
(A) No distinction between circulatory fluid and interstitial fluid – Centipede
(B) Presence of pulmonary veins – Spider
(C) Back flow of circulatory fluid into the heart via pores in the heart – Cockroach
(D) Two chambered heart – Ray
(E) Absence of blood capillaries – Carp

44. Antibodies
(A) are proteins secreted by plasma cells.
(B) are soluble forms of B lymphocyte antigen receptors.
(C) contain epitopes that initiate immune responses.
(D) inactivate pathogens in body fluids.
(E) kill body cells infected with pathogens.

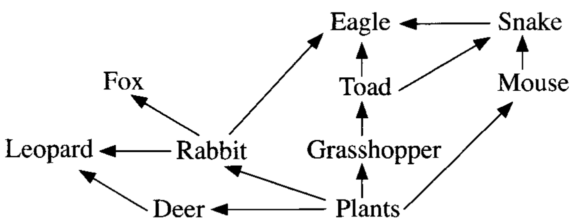
45. Which of the following cells in the testes of man are diploid?
(A) Primary spermatocytes (B) Secondary spermatocytes (C) Spermatogonia
(D) Leydig cells (E) Spermatids

46. In the human vertebral column,
(A) 24 bones are linearly arranged.
(B) cervical curvature develops at about 7–8 months after birth.
(C) thoracic region is formed by 12 vertebrae.
(D) cervical vertebrae contain foramen for vertebral arteries.
(E) lumbar vertebrae contain bifid spinous processes.

47. Which of the following statements regarding the results of Mendel's experiments is/are correct?
(A) F_2 generation of a monohybrid cross shows 3:1 phenotypic ratio.
(B) Heritable factors of a dihybrid cross are located close to each other on the same chromosome.
(C) Each heritable character is determined by two heritable factors.
(D) Heritable factors of a dihybrid cross are located on two non-homologous chromosomes.
(E) F_2 generation of a dihybrid cross shows 9:3:3:1 genotypic ratio.

48. Substitution of a single nucleotide in a DNA sequence may result in
(A) silent mutation. (B) shift in the reading frame.
(C) formation of a shorter peptide. (D) cancer.
(E) shortening of gene.

49. This question is based on the food web given below.



In the above food web, the organisms that can be considered as in the same trophic level are
(A) eagle and snake. (B) leopard and fox. (C) toad and mouse.
(D) toad and eagle. (E) grasshopper and leopard.

50. Which of the following statements regarding drinking water treatment process is/are correct?
(A) Alum is added to remove suspended matter and microorganisms.
(B) Ozone is used to kill microorganisms.
(C) During filtration stage, microorganisms are removed by absorption into sand particles.
(D) Trickling filter method is used to filter microorganisms.
(E) During the primary treatment, about 90% of organic matter is removed.

* * *

නව නිර්දේශය / புதிய பாடத்திட்டம் / New Syllabus

NEW

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
இலங்கைப் பரீட்சைத் திணைக்களம்
Department of Examinations, Sri Lanka

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය, 2020
கல்விப் பொதுத் தராதரப் பத்திர (உயர் தர)ப் பரீட்சை, 2020
General Certificate of Education (Adv. Level) Examination, 2020

ජීව විද්‍යාව II
உயிரியல் II
Biology II

09 E II

පැය තුනයි
மூன்று மணித்தியாலம்
Three hours

අමතර කියවීම් කාලය - මිනිත්තු 10 යි
மேலதிக வாசிப்பு நேரம் - 10 நிமிடங்கள்
Additional Reading Time - 10 minutes

Use additional reading time to go through the question paper, select the questions you will answer and decide which of them you will prioritise.

Index No. : ....

Instructions:

※ *This question paper consists of* **10** *questions in* **9** *pages.*

※ *This question paper comprises Part* **A** *and Part* **B.** *The time allotted for* ***both parts*** *is* ***three hours.***

PART A — Structured Essay (Pages 2 - 8)

※ *Answer* ***all four*** *questions on this paper itself.*

※ *Write your answers in the space provided for each question. Note that the space provided is sufficient for your answers and extensive answers are not expected.*

PART B — Essay (Page 9)

※ *Answer* ***four*** *questions only. Use the papers supplied for this purpose. At the end of the time allotted for this paper, before handing over to the supervisor tie the two parts together so that Part* **A** *is on the top of Part* **B.**

※ *You are permitted to remove only Part* **B** *of the question paper from the examination hall.*

For Examiners' Use Only

Part	Question No.	Marks
A	1	
	2	
	3	
	4	
B	5	
	6	
	7	
	8	
	9	
	10	
Total		

Total

In Numbers	
In Letters	

Code Numbers

Marking Examiner 1	
Marking Examiner 2	
Marks checked by	
Supervised by	

[see page two

Part A - Structured Essay

*Answer **all** questions on **this paper itself**.*
*(Each question carries **100** marks.)*

Do not write in this column

1\. (A) (i) One of the characteristic features of living organisms is irritability. What is known as irritability?

....

....

(ii) What is the monomer of each of the following?

Pectin : ....

Hemicellulose : ....

(iii) State **two** common functions of NAD^+, $NADP^+$ and FAD.

....

....

(iv) Name the structure that helps in cytoplasmic streaming and movement of chromosomes, and state its structural components.

Structure : ....

Structural components : ....

....

(v) State the location of the secondary cell wall of a plant cell and name a substance present in it other than cellulose.

Location : ....

Substance : ....

(B) (i) What are the **three** events that contribute to genetic variations during meiosis?

....

(ii) Name the type of photosynthetic pigment that prevents the formation of reactive oxidative molecules harmful to plant cells.

....

(iii) What is known as the action spectrum of photosynthesis?

....

....

(iv) Name the **two** types of cells in which CO_2 fixation occurs in C4 plants and state the CO_2 acceptor and CO_2 fixing enzyme present in each of them.

	Type of cell	CO_2 acceptor	CO_2 fixing enzyme
(a)	....	....	....
(b)	....	....	....

(v) How do the two types of cells stated in B(iv) above interconnect tightly with each other?

....

(C) (i) In which geological eon did the first eukaryotes appear on earth?

....

[see page three

(ii) Three events that occurred during evolution of organisms are as follows.

P - Origin of mammals
Q - Origin of seed plants
R - Dominance of angiosperms

Write the above events in chronological order using the relevant letters.

....

(iii) State **three** features of free living forms of phylum Platyhelminthes that cannot be seen in parasitic forms.

....

....

....

(iv) State where the male and female gametophytes are present in seed plants.

Male gametophyte : ....

Female gametophyte : ....

(v) Complete the following dichotomous key to distinguish the protists given below.

Euglena, *Paramecium*, *Amoeba*, *Ulva*, *Sargassum*, Diatoms

(1) Cell wall present ....
Cell wall absent ....

(2) Multicellular ....
Unicellular ....

(3) Gas filled floats present ....
Gas filled floats absent ....

(4) Pellicle present ....
Pellicle absent ....

(5) Cilia present ....
Cilia absent ....

100

2. (A) (i) State the **three** processes that contribute to growth of plants.

....

(ii) State **one** function of each of the following plant tissues.

Vascular cambium : ....

Cork cambium : ....

(iii) Through which structure, each of the following activities takes place in plants?

Gaseous exchange in woody stems : ....

Guttation : ....

(iv) State in correct sequence what happens in guard cells from the stage of accumulation of K^+ ions until the opening of stomata.

....

....

....

....

....

[see page four

Do not write in this column

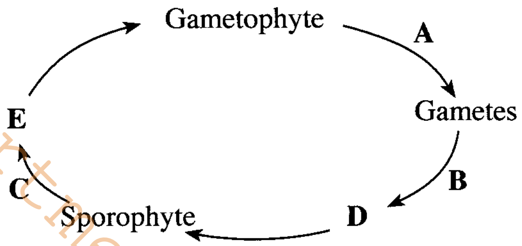
(v) How do temperatures below a critical level affect the cell membrane of plant cells?

....

....

....

(B) (i) A sketch of the life cycle of a land plant is given below.
Name the processes denoted by **A**, **B** and **C** and the structures denoted by **D** and **E**.



A : ....

B : ....

C : ....

D : ....

E : ....

(ii) State the following types of symbiosis.

Beneficial to both organisms : ....

Beneficial to one organism and no effect on the other : ....

(iii) (a) Calculate the body mass index of a person who is 153 cm tall and weighs 50 kg.

(b) According to the World Health Organization criteria, what is the minimum weight this person should have in order to consider him as non-malnourished? (Give your answer in kg to the first decimal)

(iv) Name a fat soluble vitamin that acts as an antioxidant.

....

(v) Name **two** hormones that are secreted by the digestive tract of man and have functions antagonistic to each other.

....

(C) (i) (a) State a common function of epithelial tissues and connective tissues.

....

(b) State **three** structural features of dense connective tissue that can be used to distinguish it from other connective tissues when observed under the light microscope.

....

....

....

(ii) State the functions of the SA node and AV node of the human heart.

SA node : ....

....

AV node : ....

....

[see page five

Do not write in this column

(iii) Draw the normal ECG tracing of a healthy person and label its waves.

(iv) State what are represented by the first and last waves of the ECG tracing.

First wave : ....

Last wave : ....

(v) Considering a haemoglobin molecule as 'Hb', write the equation for the chemical reaction that occurs only in the red blood cells of lung capillaries.

....

100

3. (A) (i) Briefly state what interferons are?

....

....

....

(ii) Name **two** capillary networks that are associated with the human nephron other than the glomerulus.

....

....

(iii) What is dialysis carried out for kidney patients?

....

....

(iv) State a similarity between nervous coordination and hormonal coordination.

....

(v) Name **two** phyla that include animals with brain, ventral nerve cord and segmented ganglia.

....

(B) (i) (a) What are known as ventricles in the human brain?

....

....

(b) What are the **three** parts of the human brain that form the brain stem?

....

(ii) State **two** functions of the human spinal cord.

....

....

(iii) What is the importance of refractory period of a neuron?

....

(iv) Name the progressive motor disorder of the nervous system that leads to lack of coordination and control of muscle movements in elderly people.

....

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(v) Briefly state what a hormone is?

....

(C) (i) (a) State **three** functions of Sertoli cells.

....

(b) State the function of acrosome in human sperm.

....

(c) In which structure of the male reproductive system do the sperm mature?

....

(ii) (a) State **two** methods that can be used to analyze genetic disorders of the foetus during pregnancy.

....

(b) Write in correct sequence, the pathway that oxygen poor blood of human foetus gets oxygenated and returns to the foetus.

....

(iii) Name a phylum which includes animals with an endoskeleton made up of calcium carbonate plates.

....

(iv) (a) Why **doesn't** the first pair of ribs move during inspiration of man?

....

(b) State **three** structural features of the human vertebral column that help to maintain upright posture.

....

(v) (a) State the function of the arches of the foot of the lower limb of man.

....

(b) State **two** locations where ball and socket joints are found in the human body.

....

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4. (A) (i) State **four** desirable features of garden peas for genetic experiments.

....

....

....

....

(ii) (a) What is known as pleiotropy in genetics?

....

....

(b) Give **two** examples for pleiotropy seen in man.

....

(iii) What are known as intergenic DNA and introns?

Intergenic DNA : ....

....

Introns : ....

(iv) State whether trisomy, monosomy or gene mutation is the reason for each of the following disorders.

Disorder	**Reason**
Colour blindness	....
Down syndrome	....
Turner syndrome	....

(v) (a) State why each of the following is used during DNA isolation.

Chelating agent : ....

Proteolytic enzymes : ....

Cold ethanol : ....

(b) State **two** essential features of a cloning vector.

....

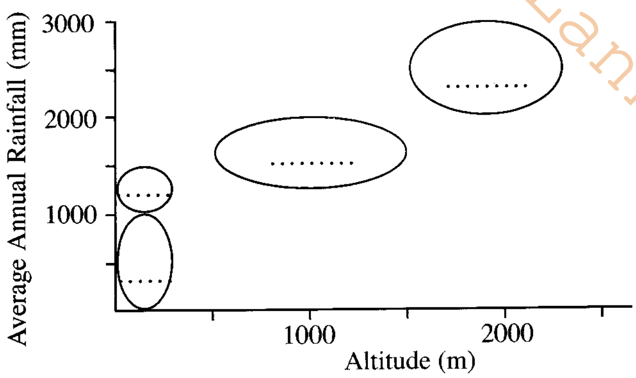
(B) (i) What is meant by primary production?

....

....

(ii) (a) Using the correct letter, indicate the ellipse in the diagram that represents each of the following ecosystems of Sri Lanka.

A – Savanna
B – Tropical thorn scrubs
C – Wet patana
D – Tropical dry mixed evergreen forests



(b) Which one of the ecosystems given in (ii)(a) above can be found in the dry zone as well as in the intermediate zone of Sri Lanka?

....

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(iii) Write the common name of an endemic plant found in tropical wet lowland rain forests of Sri Lanka.

....

(iv) Write the common name of a plant in Sri Lanka which is facing a very high risk of extinction in the wild.

....

(v) (a) State the group of organisms that contributes most to reduce the CO_2 content in the atmosphere.

....

(b) What is the major global environmental issue that affects the organisms stated in (v)(a) above?

....

(C) (i) (a) Name an obligate anaerobic bacterial species.

....

(b) State the importance of akinetes to cyanobacteria.

....

(ii) (a) COVID–19 coronavirus is roughly spherical. To which type of morphological form do such spherical viruses belong?

....

(b) How does a viroid structurally differ from a virus?

....

(iii) Name **two** diseases for which immunity can be induced using subunit vaccines.

....

(iv) Name a species of microorganisms used for the production of each of the following substances.

Citric acid from sucrose : ....

Invertase : ....

Streptomycin : ....

(v) (a) Name **two** substances that are produced when putrefaction of food occurs due to action of microorganisms.

....

(b) In routine testing of water samples for consumption, why is the presence of indicator organisms such as coliform bacteria tested instead of the presence of pathogenic microorganisms?

....

....

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* *

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இலங்கைப் பரீட்சைத் திணைக்களம்
Department of Examinations, Sri Lanka

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය, 2020
கல்விப் பொதுத் தராதரப் பத்திர (உயர் தர)ப் பரீட்சை, 2020
General Certificate of Education (Adv. Level) Examination, 2020

ජීව විද්‍යාව II
உயிரியல் II
Biology II

09 E II

Part B - Essay

Instructions:

✻ *Answer* ***four*** *questions only.*
Give clear labelled diagrams where necessary.
(*Each question carries* **150** *marks.*)

5. Describe the process of aerobic respiration that occurs in liver cells of man using glucose as the substrate.

6. (*a*) Describe the effects of light on plants.

(*b*) Explain how plants are designed to capture maximum amount of light.

7. (*a*) Briefly describe the basic structure of the human eye.

(*b*) Explain the roles of human eye and brain in vision.

8. Describe the menstrual cycle of women and its hormonal regulation.

9. (*a*) Briefly describe the applications of microorganisms in agriculture.

(*b*) Explain the applications of Polymerase Chain Reaction (PCR).

10. Write short notes on the following.

(*a*) Salt marshes of Sri Lanka

(*b*) Epigenetics

(*c*) Reproduction in Ascomycota

or

Biological control of dengue vector

✻✻✻